

- REMARKS -

Claims 1 to 20 are currently in the application.

The claim rejections indicated in the Examiner's action are as follows:

Claims	§112(2)	§101	§102(a)	Status/References
1-18	X			Indefinite for omitting essential structural cooperative relationships of elements
1-20		X		Not directed to a technological art
19			X	Anticipated by Truc et al.

The Examiner has indicated that claims 1-18 and 20 would be allowable if rewritten to overcome the rejection(s) under both 35 U.S.C. 101 and 112(2) and to include all limitations of the base claim and any intervening claim.

Claims 1 and 19 have been amended. No new matter has been added.

With respect to the rejection of claims 1-18 under 35 USC 112(2), Applicants have amended claim 1 to more clearly define how the first concentration determined is used in the following steps, specifically in the corrected concentration calculation step. The first and second steps are now more clearly cooperating. The second and third steps are not also more clearly cooperating in that the step of calculating a changed transport properties profile is carried out from the first solid phase profile of the second step. All steps clearly form part of a whole. It will be understood that although the electrical potential profile is determined in the first step, it is not directly used in the following steps. It is simply a by-product of the transport algorithm, which will be readily understood by one skilled in the art.

This is believed to overcome the rejection under 35 USC 112(2).

With respect to the rejection of claims 1-20 under 35 USC 101, Applicants have amended the preamble of the independent claims to recite that the methods are "computer-implemented methods" as proposed by the Examiner. All claims are directed to patentable subject matter since the methods of the present invention can be used in

the industry as computer implemented methods to solve technological problems found in the technological arts.

This is believed to overcome the rejection under 35 USC 101.

Claim 19 has been amended and is for a computer-implemented method for determining a diffusion coefficient for each of at least two ions capable of undergoing transport in a cement-based material. The cement-based material has a solid skeleton and pores, the pores being at least one of liquid-filled and vapor-filled. The porosity of the cement-based material is provided. The method comprises determining a concentration for each said at least two ions and an electrical potential profile using a transport algorithm, wherein the transport algorithm is a function of a diffusion of said at least two ions, of an electrical coupling between said at least two ions and a chemical activity of each said at least two ions and wherein said electrical coupling is solved using a Poisson equation; determining an electrical current using said concentration and said electrical potential profile; and determining a diffusion coefficient for each of at least two ions using said electrical current.

Truc et al. ("Numerical Simulation of Multi-Species Transport through Saturated Concrete During a Migration Test – MsDiff Code", Cement and Concrete Research, Vol. 30, No. 10, pp. 1581-1592, October 2000) is also for calculating an ion concentration. Truc et al. uses a ionic transport algorithm. However, Truc et al. eliminates the electrical potential and current from the ionic transport algorithm by reorganizing the equations. He therefore does not calculate the electrical potential and the electrical current. The equations in Truc et al. are solved assuming a constant current.

In Applicants' invention, the electrical current is taken into account in the resolution of the equations. The electrical coupling is solved using a Poisson equation. The electrical current is determined using the concentration and the electrical potential profile. The diffusion coefficient is determined for each ion using the electrical current.

Applicants' invention is clearly not taught or suggested by Truc et al.

Therefore, Applicants believe that claim 19 is novel and not obvious.

In view of the foregoing, reconsideration of the rejection of claims 1-20 is respectfully requested. It is believed that claims are allowable over the prior art, and a Notice of Allowance is earnestly solicited.

Respectfully submitted,

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